1. **Department, number, and title of course**

   Department of Civil Engineering, CENG 5376, Indoor Environmental Quality, Formerly ENGR 5335 Indoor Air Quality and Environmental Engineering

2. **Elective Course**

3. **Course (catalog) description**

   Graduate level course in indoor air quality is designed to address the issues associated with maintaining a safe and healthy environment in occupied structures; handling a range of issues like health, comfort effects, physiological thresholds, and ventilation measurement. Students also learn the fundamentals of HVAC and its role in IEQ and occupant comfort.

4. **Prerequisite(s)**

   None

5. **Textbook(s) and/or other required material**


6. **Course Objectives**

   - Define the broad field of indoor environment (air) quality
   - Solve problems based on ventilation, humidity and air flow within a building
   - Demonstrate working knowledge air filtration and air movement.
   - Describe the characteristics of poor indoor environmental quality leading to “Sick Building Syndrome” and Building Related Illness.”
   - Identify sources of contamination and distinguish their origin in order to control their distribution in a building.
   - Explain the process of IEQ investigation and building commissioning
   - Understand the regulatory concerns (federal, state and local) regarding indoor environments.
   - Describe the process for IEQ modeling
   - Prepare a building investigation plan for addressing IEQ complaints

7. **Topics Covered**

   - HVAC Systems
   - Comfort Criteria
   - ASHRAE Standards for Indoor Environment
   - Evaluation Criteria and Assessing IEQ
   - Ventilation System Evaluation
   - Fresh Air Requirements and Thermal Comfort
   - Ventilation Characterization
   - Indoor Pollutants and their Control
   - Human Responses and Health Effects
   - Indoor Air Quality by Design
   - Special Indoor Environments
   - Current Regulations for IEQ and Litigation

8. **Class/laboratory schedule, i.e., number of sessions each week and duration of each session**
LESSONS: 15 @ 150 min (1 att/wk)  

**9. Contribution of course to meeting the professional component**

3.0 Credit Hours (ES=2.5, ED=0.5)

This course focuses on the built environment, indoor environmental quality and aspects of sustainable design. The course provides students with knowledge of IEQ strategies as they are applied to the diversity of styles/types, sizes and occupancies of the modern built environment. Designers often attempt to isolate the buildings’ occupants from the ambient environment yet neglect to realize that in that isolation a new environment with contamination potential is created. In this protective environment there is the possibility of developing a new dimension of noxious characteristics, because although the design of structures is primarily to provide shelter from an often hostile outdoor environment, the shelter provided is less than perfect.

**10. Relationship of course to program outcomes**

The course director’s assessment of how this course contributes to the civil engineering program outcomes is listed below. The following scale is used:

1=No Contribution; 2=Small Contribution; 3=Average Contribution; 4=Large Contribution; 5=Very Large Contribution

<table>
<thead>
<tr>
<th>CIVIL ENGINEERING PROGRAM OUTCOMES</th>
<th>Course Director Assessment</th>
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</thead>
<tbody>
<tr>
<td>Students who qualify for graduation with a civil engineering masters will demonstrate:</td>
<td></td>
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<tr>
<td>Have developed specialized knowledge in civil engineering beyond that normally expected of undergraduates preparing them for advanced professional practice.</td>
<td>5</td>
</tr>
<tr>
<td>When conducting graduate research, have generated new knowledge and engineering methods to serve the State, the Nation, and the global community.</td>
<td>2</td>
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**11. Person(s) who prepared this description and date of preparation**

Dr. J. Torey Nalbone, CIH, Associate Professor, 1 November 2007.